



State of Utah  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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May 10, 2001

Ron Ryan  
Environmental Specialist  
SF Phosphates Limited Company  
9401 North Highway 91  
Vernal, Utah 84087-7802

Re: Review of Latest Submissions, Large Mining Operations Revision (Tailings Storage Facility), SF Phosphates Limited Company, Vernal Phosphate Operations, M/047/007, Uintah County, Utah

Dear Mr. Ryan :

The Division has completed a review of your response submissions dated January 31, 2001, April 11, 2001, and informal fax information of May 1, 2001, regarding the Tailings Storage Facility Revision for the Vernal Phosphate Operations, located in Uintah County, Utah. After reviewing the information, there are several issues relating to the surety estimate that need to be resolved before the Division can offer tentative approval of this Revision. The attached comments describe the issues to be resolved. Please provide a response to this review at your earliest convenience.

The Division will suspend further review of this revision until your response to this letter is received. If you have any questions in this regard please contact me, or Tony Gallegos at (801) 538-5286 or 538-5267 respectively. If you wish to arrange a meeting or site inspection to discuss this review, please contact us at your earliest convenience. Thank you for your cooperation in completing this permitting action.

Sincerely,

D. Wayne Hedberg  
Permit Supervisor  
Minerals Regulatory Program

jb  
Attachment: Review Comments – May 8, 2001  
cc: Opie Abeyta, BLM State Office  
Pete Sokolosky, BLM Vernal FO  
O:\REVIEW\m47-07-3 review.wpd

**REVISION REVIEW COMMENTS**  
**SF Phosphates Limited Company**  
**Vernal Phosphates Operations**  
**M/047/007**  
Last Revised 05/10/2001

**R647-4-113 - Surety**

The latest SF response used seeding rates that were reduced from the previous Division recommendation of April 1995. These seeding rates were modified after a phone discussion with Lynn Kunzler of the Division. It appears there was a misunderstanding in this discussion. The Division's preferred seeding rates are accurately represented in the two price quotes from Stevenson Intermountain Seed dated November 27, 2000. The preferred seeding rate for aerial seeding of the tailings nurse crop is 5.0 lbs/acre at an estimated seed cost of \$23.40/acre. The preferred seeding rate for the final reclamation of all areas is 11.45 lbs/acre for drill seeding, at an estimated seed cost of \$121.83/acre; and a rate of 17.18 lbs/acre for broadcast seeding, at an estimated seed cost of \$182.75/acre. The revised cost estimate (attached) includes these unit costs for seed mixes.

The Division has revised the cost estimate to include aerial seeding of the nurse crop on the impounded tailings material. Recent aerial seeding at another mine site suggests an application cost of \$15.00/acre for aerial seeding of the impounded tailings material. The Division has revised the cost estimate for the impounded tailings to reflect the application of organic matter at 1 ton per acre, until test plot results support an alternate rate.

**COMMENTS ON SF ESTIMATE IN APRIL 11, 2001 RESPONSE**

The Figure 1 – Bond Summary section in the April 11, 2001 SF response used categories that do not match those categories listed on the Reclamation Progress Map, Figure 2, version date 1-2-00. Please identify the acreages and categories from the Reclamation Progress Map that were used to support the acreages shown in Figure 1 – Bond Summary.

Please revise the Reclamation Progress Map to include a separate border for those disturbed areas associated with operational facilities. The current version of this map identifies these operational areas with the same border used to identify unreclaimed mining disturbances.

The unit cost figure of \$229/acre was used for the "mining reclaimed" category in the SF estimate. We understand this figure was to represent the reclamation tasks required after topsoil placement. These costs (after modifying the seed mix cost as stated above) are seed mix \$121.83/acre, and fertilizer \$38.00/acre. The Division has revised the estimate to reflect these unit costs for the category of "mining reclaimed."

The SF estimate used the cost of \$248/acre for the reclamation category of "tailings pond – impounded material" reclamation. The Division has revised the estimate to reflect the modified seed mix costs and the tasks of disking the nurse crop and mulch.

The SF estimate used a figure of 317 acres to represent the maximum tailings disturbance within the next five years of operation. The previous Division estimate used a figure of 345 acres that appears to be based on the maximum tailings disturbance. The Division is in agreement with using the figure of 317 acres as the maximum tailings disturbance during the next five years.

The SF estimate used the acreages in Figure 1 to represent the maximum reclamation cost/liability during the next five-year period. The active mining disturbance will not exceed 313.9 acres, plus three years worth of mining expansion at 210 acres, and the reclaimed mining area will never be less than 147.8 acres. SF's justification for using these figures to calculate a cost estimate include: 1) these acreages are based on current and anticipated production rates, 2) these acreages represent conservative disturbance and reclamation acreages supported by historic averages, 3) these acreages reflect the existing mine plans and continued integration of concurrent mining practices. Three years of future mine expansion at 70 acres/year were included to reflect the Division's policy of requiring a reseeded area to survive up to three growing seasons before being fully released.

The Division has revised the estimate to omit the task of contouring for the SAG Mill and Shop area based on SF's information that these facilities are situated on gentle slopes and contouring will not be necessary.

The Division's last estimate included the line item of regrading as needing confirmation in the calculation section for the category of "Tailings Pond – Impounded Material." The Division's estimate included regrading in this category based on the previous SF estimate of March 2000, which included regrading of ten mounds of material approximately 100 feet in diameter and ten feet high. The March SF estimate included a volume of 100 cubic yards for this line item, although the calculated volume for ten cone shaped mounds of these dimensions would amount to approximately 969 cubic yards. The Division has revised the estimate to reflect regrading of this volume (969 cubic yards) of tailings material.

The Division's estimate identified the line item of topsoil spreading as needing confirmation in the calculation sections for: Panel C – Misc., the Main Office and Mill, Unpaved Roads, Paved Roads, and Pipeline. Based on SF's informal response, this task should be omitted for these areas. Fertilization is included in the estimate for these areas, and this should increase the relative revegetation success in these areas. The 1984 reclamation estimate did not include topsoil replacement tasks for the categories listed as "Plant Facilities/Concentrator Area" and "Roads" which would also support the omission of this task in this estimate.

The Division's last estimate requested verification of the pipeline decommissioning tasks and acreage. SF's informal response indicated these decommissioning tasks seemed appropriate and the acreage is probably greatly overestimated. Reclamation would include capping the line and removal of surface signage and monitoring apparatus. Much less than 2.5 acres is anticipated, and topsoil is already available on the previously reclaimed line.

The Division has revised the cost estimate to identify reclamation tasks specifically for the Class IIIb Landfill that is permitted with the State Division of Solid and Hazardous Waste. This modification should help avoid double bonding for this feature during the active mine life and for three years following final reclamation.

The Division's last estimate identified the line item of welding equipment under the Demolition costs (IX Bonding) section and the Revised MRP August 1984 section as an item needing clarification. These two sections from the old estimate have been omitted in the revised estimate. The updated spreadsheet of structures and features in the latest SF response has replaced these two old sections and the old listing of structures requiring demolition.

Page 3  
SF Phosphates  
M/047/007  
May 10, 2001

Based on the informal information provided by SF, we understand that the quote from Grant Mackay Demolition Company for concrete demolition was intended to apply to reinforced concrete as discussed over the phone. With the recent receipt of a copy of their estimate the Division can recognize their unit costs for concrete demolition as shown in Figure 8 – Demolition Cost Estimate provided by SF.

The latest demolition cost estimate prepared by SF uses modified unit costs from the Means Heavy Construction Cost Data. The 2001 Means Heavy Construction Cost Data unit costs for building demolition, for large urban projects, are based on a 20-mile haul, no foundation or dump fees, and the volume of building standing. The crew for large urban projects is listed as Crew B-8. Crew B-8 includes: a labor foreman, two laborers, two equipment operators, one equipment oiler, two truck drivers, one hydraulic crane, one front-end loader, and two dump trucks. The Division has modified the truck driving portions of the Means unit costs to reflect a 5-mile haul distance by reducing trucking costs to  $\frac{1}{4}$  (five miles is  $\frac{1}{4}$  of 20 miles). The attached estimate includes these modified unit costs for the four types of building construction.

This latest SF estimate for demolition applied a Means City Cost Index for Price, Utah, of 57.61% from the category of “installation.” The Division agrees that out of the possible categories, the “installation” category would be most applicable to demolition tasks. The Division disagrees with applying the index for Price, Utah to the demolition costs. Using this index would imply that if the bond was forfeited, the most appropriate third party estimate of the costs would be based on the work being performed by a Price contractor at the current local rates. This would not represent the most likely Third Party Cost for reclamation of the site. Using the same Means table for Location Factors, the average of the five Utah cities for the “installation” category would be 73.36%. The Division has revised the demolition portion of the cost estimate to reflect this average Utah city location factor.

The April 11, 2001 response from SF, acknowledges additional surety amounts for mobilization, a 10% contingency, site monitoring, and five years of escalation will be added to the base calculations. We understand that SF wishes to propose a bond calculation that includes three years of escalation. Division policy typically requires five years of escalation, although SF is free to propose an alternative escalation for consideration by Division management. The Division has revised the cost estimate to show the three-year and five-year escalation amounts for comparison. **The resulting reclamation surety estimate currently requested by the Division including five years of escalation (year 2006 dollars) is \$3,312,000.**

Attachments: Surety estimate, Acreage Balance Sheet  
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**RECLAMATION SURETY ESTIMATE****DRAFT**

filename m47-7may01.w

S.F. Phosphates Ltd. Company

17/007

Last Update

8-May-2001

Vernal Phosphate Operations

Utah County, Utah

page "estimate"

PAGE NUMBER:

Prepared by Utah Division of Oil, Gas &amp; Mining (AAG)

**Estimate Details**

-This estimate is based on information from the SF Estimate of April 2001

-Information supporting unit costs is on a separate spreadsheet page.

-The estimate for demolition of facilities is on a separate spreadsheet page.

-Shading or "???" highlight items of significance or items which require confirmation.

**MINING PANEL DISTURBANCE**

	313.9 acres	days; acres	\$/HR; \$/acre	\$
project manager		157.0	49.63	62,309
contouring D9N, 100 ft, 1.5 ft depth	2 acre/day	157.0	219.19	275,215
topsoil spreading 637E P-P, 6 inch depth	3.9 acre/day	80.5	373.77	240,670
seeding & fertilizing - DH4	29.4 acre/day	10.7	112.44	9,604
seed mix - drill seed	acre>	314	121.83	38,242
fertilizer	acre>	314	38.00	11,928
Total				637,968

\$2,032 per acre

**PARTIALLY RECLAIMED MINING DISTURBANCE**

-This "partially reclaimed" section is for mine disturbances which have been regraded &amp; topsoil replaced, but not yet seeded.

	147.8 acres	days; acres	\$/HR; \$/acre	\$
project manager		5.0	49.63	1,996
contouring D9N, 100 ft, 1.5 ft depth	2 acre/day	73.9	219.19	0
topsoil spreading 637E P-P, 6 inch depth	3.9 acre/day	37.9	373.77	0
seeding & fertilizing - DH4	29.4 acre/day	5.0	112.44	4,522
seed mix - drill seed	acre>	148	121.83	18,006
fertilizer	acre>	148	38.00	5,616
Total				30,141

\$204 per acre

**LANDFILL - VERIFY TASKS**

-Ultimate closure of this Class IIIb landfill must satisfy Div. of Solid &amp; Hazardous Waste.

-Final closure requires a 2-foot cover of borrow material graded to match the surrounding topography.

	7.5 acres	days; acres	\$/HR; \$/acre	\$
project manager		3.8	49.63	1,489
contouring D9N, 100 ft, 1.5 ft depth	2 acre/day	3.8	219.19	6,576
topsoil spreading 637E P-P, 1 ft depth	1.9 acre/day	3.9	373.77	11,803
seeding & fertilizing - DH4	29.4 acre/day	0.3	112.44	229
seed mix - drill seed	acre>	8	121.83	914
fertilizer	acre>	8	38.00	285
Total				21,296

\$2,839 per acre

**RECLAMATION SURETY ESTIMATE****DRAFT**

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S.F. Phosphates Ltd. Company

7/007

Last Update

May-2001

Vernal Phosphate Operations

Utah County, Utah

page "estimate"

PAGE NUMBER:

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**FUTURE MINING**

-A projected disturbance for 3 years of future mining @ 70 acres/year.

-The specific 70-acre areas are not identified on a map.

	210 acres	days; acres	\$/HR; \$/acre	\$
project manager		105.0	49.63	41,685
contouring D9N, 100 ft, 1.5 ft depth	2 acre/day	105.0	219.19	184,120
topsoil spreading 637E P-P, 6 inch depth	3.9 acre/day	53.8	373.77	161,009
seeding & fertilizing - DH4	29.4 acre/day	7.1	112.44	6,425
seed mix - drill seed	acre>	210	121.83	25,584
fertilizer	acre>	210	38.00	7,980
Total				426,803
		\$2,032	per acre	

**SAG MILL & SHOP**

-SAG Mill (15 acres) &amp; Mine Shop (6.2 acres)

	21.2 acres	days; acres	\$/HR; \$/acre	\$
project manager		5.4	49.63	2,158
ripping - D9N, 0.4 mph	3.15 acre/day	6.7	257.00	13,839
topsoil spreading 637E P-P, 6 inch depth	3.9 acre/day	5.4	373.77	16,254
seeding & fertilizing - DH4	29.4 acre/day	0.7	112.44	649
seed mix - drill seed	acre>	21	121.83	2,583
fertilizer	acre>	21	38.00	806
Total				36,288
		\$1,712	per acre	

**MAIN OFFICE & MILL - PLANT FACILITIES AREA**

-Earthwork &amp; revegetation tasks for the Main Office &amp; Mill area after structure demolition.

-Demolition of facilities is described on a separate spreadsheet page.

-Original 1984 reclamation estimate did not include topsoil tasks at these facilities.

	24 acres	days; acres	\$/HR; \$/acre	\$
project manager		7.6	49.63	3,025
ripping - D9N, 0.4 mph	3.15 acre/day	7.6	257.00	15,667
topsoil spreading 637E P-P, 6 inch depth	3.9 acre/day	0.0	373.77	0
seeding & fertilizing - DH4	29.4 acre/day	0.8	112.44	734
seed mix - drill seed	acre>	24	121.83	2,924
fertilizer	acre>	24	38.00	912
Total				23,262
		\$969	per acre	

**UNPAVED ROADS**

-These roads are identified on the map labelled Figure 4 in the April 2001 submission.

-Original 1984 reclamation estimate did not include topsoil tasks for roads.

	42 acres	days; acres	\$/HR; \$/acre	\$
project manager		21.0	49.63	8,337
contouring D9N, 100 ft, 1.5 ft depth	2 acre/day	21.0	257.00	43,176
topsoil spreading 637E P-P, 6 inch depth	3.9 0	0.0	373.77	0
seeding & fertilizing - DH4	29.4 acre/day	1.4	112.44	1,285
seed mix - drill seed	acre>	42	121.83	5,117
fertilizer	acre>	42	38.00	1,596
Total				59,511
		\$1,417	per acre	

**RECLAMATION SURETY ESTIMATE****DRAFT**

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S.F. Phosphates Ltd. Company

7/007

Last Update

8-May-2001

Vernal Phosphate Operations

Utah County, Utah

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PAGE NUMBER:

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**PAVED ROADS**

-These roads are identified on the map labelled Figure 4 in the April 2001 submission.

-Original 1984 reclamation estimate did not include topsoil tasks for roads.

	13.1 acres	days; acres	\$/HR; \$/acre	\$
project manager		4.2	49.63	1,651
contouring D9N, 100 ft, 1.5 ft depth	2 acre/day	6.6	219.19	11,486
ripping - D9N, 0.4 mph	3.15 acre/day	4.2	257.00	8,551
topsoil spreading 637E P-P, 6 inch depth	3.9 acre/day	0.0	373.77	0
seeding & fertilizing - DH4	29.4 acre/day	0.4	104.65	373
seed mix - drill seed	acre>	13	121.83	1,596
fertilizer	acre>	13	38.00	498
Total				24,155
		\$1,844	per acre	

**TAILINGS POND - MISCELLANEOUS AREAS**

-Miscellaneous areas associated with the tailings as described in Figure 6 in the April 2001 submission.

	60.9 acres	days; acres	\$/HR; \$/acre	\$
project manager		19.3	48.25	7,464
ripping - D9N, 0.4 mph	3.15 acre/day	19.3	257.00	39,754
topsoil spreading 637E P-P, 6 inch depth	3.9 acre/day	15.6	373.77	46,692
seeding & fertilizing - DH4	29.4 acre/day	2.1	104.65	1,734
seed mix - drill seed	acre>	61	121.83	7,419
fertilizer	acre>	61	38.00	2,314
Total				105,378
		\$1,730	per acre	

**TAILINGS POND - IMPOUNDED MATERIAL**

-This acreage represents the maximum tailings area within 5 years, i.e. by 2006.

	317 acres	days; acres	\$/HR; \$/acre	\$
project manager		10.8	48.25	4,162
aerial seed application	15 \$/acre	317.0	15.00	4,755
initial seed mix - nurse crop	23.40 \$/acre	317.0	23.40	7,418
initial fertilizer	38 \$/acre	0.0	0.00	12,046
regrading D8N - 10(100 dia x10) -DOGM	9,691 cy	0.0	0.68	6,590
discing nurse crop - DH4	29.4 acre/day	10.8	104.65	9,027
applying seed & fertilizer - DH4	29.4 acre/day	10.8	104.65	9,027
mulch application - DH4 w/attachment	34.9 acre/day	9.1	107.17	7,787
discing mulch in - DH4	29.4 acre/day	10.8	104.65	9,027
seed mix - drill seed	acre>	317	121.83	38,620
fertilizer	acre>	317	38.00	12,046
mulch @ 1 ton/acre - alfalfa	acre>	317	100.00	31,700
Total				152,205
		\$480	per acre	

**PIPELINE**

-Maximum area re-disturbed due to decommissioning or repair of the pipeline at final reclamation.

	2.5 acres	days; acres	\$/HR; \$/acre	\$
project manager		1.3	48.25	483
contouring D9N, 100 ft, 1.5 ft depth	2 acre/day	1.3	219.19	2,192
seeding & fertilizing - DH4	10 acre/day	0.3	104.65	209
seedmix - drill seed	acre>	2.5	121.83	305
fertilizer	acre>	2.5	38.00	95
Total				3,283
		\$1,313	per acre	

## RECLAMATION SURETY ESTIMATE

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S.F. Phosphates Ltd. Company

1/007

Last Update

May-2001

Vernal Phosphate Operations

Utah County, Utah

page "estimate"

PAGE NUMBER:

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**BONDING SUMMARY**

	<u>ACRE</u>	<u>\$</u>	<u>\$/acre</u>
Panel B	313.9	637,968	2,032
Panel C	147.8	30,141	204
Landfill -NEW LINE ITEM VERIFY TASKS	7.5	21,296	2,839
Future Mining	210.0	426,803	2,032
SAG Mill & Shop	21.2	36,288	1,712
Plant Facilities	24.0	23,262	969
Unpaved Roads	42.0	59,511	1,417
Paved Roads	13.1	24,155	1,844
Tailings Pond - Miscellaneous Areas	60.9	105,378	1,730
Tailings Pond - Impounded Material	317.0	152,205	480
Pipeline	2.5	3,283	1,313
Demolition		1,040,974	
	<b>SUBTOTAL</b>	<b>2,561,265</b>	
Mobilization - 7 pieces of equipment		<b>7,000</b>	
	<b>SUBTOTAL</b>	<b>2,568,265</b>	
ADD 10% Contingency		<b>256,826</b>	
	<b>SUBTOTAL</b>	<b>2,825,091</b>	
ADD site monitoring - 3 years		<b>15,000</b>	
	<b>SUBTOTAL</b>	<b>2,840,091</b>	
ESCALATION FOR 3 YEARS @ 3.12%/YR		<b>274,213</b>	
<b>TOTAL IN 2004-\$</b>		<b>\$3,099,304</b>	

**ROUNDED TOTAL IN 2004-\$****\$3,099,000 DRAFT****8-May-2001**

TOTAL AREA BONDED =

**1,159.9 ACRES**

AVG. COST/ACRE = \$2,672

CHECK> **1,159.9**

ESCALATION FOR 5 YEARS @ 3.12%/YR

471,577

**TOTAL IN 2006-\$****\$3,311,668****ROUNDED TOTAL IN 2006-\$****\$3,312,000**

DIFFERENCE =

**\$213,000**

TOTAL AREA BONDED =

**1,159.9 ACRES**

AVG. COST/ACRE = \$2,855

BUILDINGS & STRUCTURES	BUILDING DIMENSIONS			BLDG VOL (cf)	CONST. TYPE	CONCRETE	CONCRETE	CONC.	CONC.	BLDG. DEMO.	TOTAL COST
	L (ft)	W (ft)	H (ft)			1FT THICK	2 FT THICK	REMOVAL	DEMO.		
						AREA (sf)	AREA (sf)	COST (\$/sf)	\$		
mine shop	173.25	61.49	40	426,126	mix	10,653		2.25	23,970	80,964	104,933
mine oil shed	41.99	30.09	16	20,216	mix	632	6-inch thick	2.25	1,421	3,841	5,262
mine fuel storage	42.49	17.52	16	11,911	concrete	372	6-inch thick	2.25	837	2,978	3,815
stacker shed	18.82	16.04	16	4,830	mix	151	6-inch thick	2.25	340	918	1,257
feeder breaker MCC	20.29	15.48	16	5,025	mix	157	6-inch thick	2.25	353	955	1,308
feeder breaker tool building	17.2	15.24	16	4,194	mix	131	6-inch thick	2.25	295	797	1,092
stacker shed	0	0	0	50	tons steel	0		2.25	0	22,750	22,750
SAG mill building	146	92	65	873,080	steel	0	13,432	4.5	60,444	157,154	217,598
SAG warehouse	51.02	34.05	16	27,796	mix	1,737		2.25	3,909	5,281	9,190
SAG switch gear	31	14.12	12	5,253	steel	219	6-inch thick	2.25	492	945	1,438
SAG MCC	39.26	30.83	16	19,366	mix	605	6-inch thick	2.25	1,362	3,680	5,041
steady head tank	99.6	22.56	16	35,952	concrete	1,123	6-inch thick	2.25	2,528	8,988	11,516
portable water building	12.3	10.01	25	3,078	mix	62	6-inch thick	2.25	139	585	723
apron feeder tunnel	0	0	0	0	concrete	2,500		2.25	7,575	0	7,575
reject conveyor gallery	0	0	0	25	tons steel	0		2.25	0	11,375	11,375
office-lab warehouse	260.25	63.88	24	398,994	mix	12,469		2.25	28,055	75,809	103,864
rubber shop	130.71	41.53	24	130,281	steel	2,714	6-inch thick	2.25	6,107	23,451	29,558
electric shop	103.12	51.51	24	127,481	steel	2,656	6-inch thick	2.25	5,976	22,947	28,922
core building	37.16	32.94	16	19,585	mix	612	6-inch thick	2.25	1,377	3,721	5,098
old office building	68.83	49.2	12	40,637	mix	1,693	6-inch thick	2.25	3,810	7,721	11,531
lay down area	0	0	0	0		0		0	0	0	0
mill - - - - -											
hydrosizer building	104.05	30.7	80	255,547	steel	0	3,194	4.5	14,375	45,998	60,373
primary flotation building	154.87	83.66	60	777,385	steel	0	12,956	4.5	58,304	139,929	198,233
pump station	99.44	83.85	40	333,522	steel	0	8,338	4.5	37,521	60,034	97,555
scavenger grind	151.2	96.04	30	435,637	steel	0	14,521	4.5	65,346	78,415	143,760
scavenger flotation	77.09	55.62	30	128,632	steel	0	4,288	4.5	19,295	23,154	42,449
scavenger section MCC	24	36	12	10,368	mix	0	864	4.5	3,888	1,970	5,858
west tee pee	0	0	0	20	tons steel	0		2.25	0	9,100	9,100
east tee pee	0	0	0	40	tons steel	0		2.25	0	18,200	18,200
conc. tee pee	0	0	0	14	tons steel	8,000		3.03	24,240	6,370	30,610
tanks - - - - -											
no. 1 slurry tank	0	0	0	16	tons steel	2,000		2.25	4,500	7,280	11,780
no. 2 slurry tank	0	0	0	16	tons steel	2,000		2.25	4,500	7,280	11,780
no. 3 slurry tank	0	0	0	16	tons steel	2,000		2.25	4,500	7,280	11,780
no. 4 slurry tank	0	0	0	10	tons steel	970		2.25	2,183	4,550	6,733
no. 5 slurry tank	0	0	0	10	tons steel	970		2.25	2,183	4,550	6,733
reclaim water thickener	0	0	0	5	tons steel	0		2.25	0	2,275	2,275
slurry surge tank	0	0	0	16	tons steel	0		2.25	0	7,280	7,280
reclaim water tank	100	50	20	100,000	concrete	11,000		2.25	24,750	25,000	49,750
fresh water tank 1	0	0	0	5	tons steel	0		2.25	0	2,275	2,275
fresh water tank 1	0	0	0	5	tons steel	0		2.25	0	2,275	2,275
potable water building	18	24	16	6,912	mix	216	6-inch thick	2.25	486	1,313	1,799
ratliff spring building	30	30	12	10,800	mix	2,250		2.25	5,063	2,052	7,115
water well a	12	10	10	1,200	mix	60	6-inch thick	2.25	135	228	363
water well b	12	10	10	1,200	mix	60	6-inch thick	2.25	135	228	363
water well c	12	10	10	1,200	mix	60	6-inch thick	2.25	135	228	363
water well d	12	10	10	1,200	mix	60	6-inch thick	2.25	135	228	363
water well e	12	10	10	1,200	mix	60	6-inch thick	2.25	135	228	363
water well h	12	10	10	1,200	mix	60	6-inch thick	2.25	135	228	363
catch dam pumphouse	12	14	10	1,680	mix	84	6-inch thick	2.25	189	319	508
truck scale	75	20	0	0	concrete	1,500		2.25	3,375	0	3,375
scale house	12	10	10	1,200	mix	60	6-inch thick	2.25	135	228	363
concentrate bins	0	0	0	5	tons steel	0		2.25	0	2,275	2,275
jet belt	350	0	0	14	tons steel	0		2.25	0	6,370	6,370
conveyor gallery 18	75	0	0	19	tons steel	0		2.25	0	8,645	8,645
conveyor gallery 18a	35	0	0	9	tons steel	0		2.25	0	4,095	4,095
conveyor gallery 3	150	0	0	38	tons steel	0		2.25	0	17,290	17,290
conveyor gallery 4	200	0	0	50	tons steel	0		2.25	0	22,750	22,750
conveyor gallery 13	200	0	0	50	tons steel	0		2.25	0	22,750	22,750
conveyor gallery 13a	25	0	0	6	tons steel	0		2.25	0	2,730	2,730
conveyor gallery 14	125	0	0	31	tons steel	0		2.25	0	14,105	14,105
Total Demolition Costs											1,418,994
Average Utah City index											0.7336
Adjusted Total Demolition Costs											\$1,040,974

RECLAMATION SURETY ESTIMATE		DRAFT		filename m47-7may01.wb3			
S.F. Phosphates Ltd. Company		M/047/007		Last Update 8-May-2001			
Vernal Phosphate Operations		Uintah County, Utah		page "unit_costs" PAGE NUMBER:			
Prepared by Utah Division of Oil, Gas & Mining (AAG)							
MASTER LISTING - UNIT COSTS							
-Changes to unit costs on this page will ripple through the estimate spreadsheet.							
task description	\$/hr	CY/acre	CY/hr	\$/acre	hr/acre	acre/day	\$/day
project manager	49.63	NA	NA	NA	NA	NA	397.00
Means Heavy Construction Cost Data 2001, 01300-700-0180, project manager, minimum \$1,985/wk => \$397/day							
laborer	38.35	NA	NA	NA	NA	NA	306.80
Means Heavy Construction Cost Data 2001, Crew B-6, including O & P							
contouring - D9N dozer, 100 ft push, 1.5 ft avg. depth	219.19	2,420.0	606.4	874.74	3.99	2.00	1,753.52
DOGM calculations using Rental Rate Blue Book 3Q00 for Cat D9N & Means 2000 Crew B-10B							
topsoil spreading - 637E P-P scraper, 1/4 mi. one-way, 6 in depth	373.77	806.7	396.5	760.42	2.03	3.93	2,990.16
DOGM calculations using Rental Rate Blue Book 3Q00 for Cat 637E P-P & Means 2000 Crew B-10B							
application of seed & fertilizer - DH4 XL Series III dozer (1996)	112.44	0.0	0	30.60	0.26	29.40	899.52
Rental Rate Blue Book 3Q00 for Cat DH4 XL at 4.0 mph plus trailer towed diesel mulcher & Means 2001 Crew B-10B							
seed mix - nurse crop	0	0.0	0	23.40	NA	NA	0.00
Stevenson International Seed quote of 11-27-00 for SF @ rate of 5.0 lb/acre							
seed mix - drill seed rate	0	0.0	0	121.83	NA	NA	0.00
Stevenson International Seed quote of 11-27-00 for SF @ rate of 11.45 lb/acre							
seed mix - broadcast seed rate (1.5 x drill seed rate)	0	0.0	0	182.75	NA	NA	0.00
Stevenson International Seed quote of 11-27-00 for SF @ rate of 17.18 lb/acre							
fertilizer	0	0.0	0	38.47	NA	NA	0.00
Intermountain Farmers Association quote 3-16-00 in SF submission of March 2000 averaging to \$38.47/acre							
ripping - D9N dozer , 0.4 mph, multi-shank, 3 adj. parallel	257.00	0.0	0	652.78	2.54	3.15	2,056.00
DOGM calc., Rental Rate Blue Book 3Q00 for Cat D9N, multi-shank rippers, 3 adj. parallel & Rental Rate Blue Book 3Q00 Crew B-10B							
discing - DH4 XL dozer	112.44	0.0	0	30.60	0.26	29.40	899.52
Rental Rate Blue Book 3Q00 for Cat DH4 XL at 4.0 mph plus trailer towed diesel mulcher & Means 2001 Crew B-10B							
mulching - DH4 XL dozer	112.44	0.0	0	25.77	0.18	34.90	899.52
Rental Rate Blue Book 3Q00 for Cat DH4 XL @ 5.0 mph plus trailer towed diesel mulcher & Means 2001 Crew B-10B							
D8N dozer - regrading	187.05	NA	NA	NA	NA	NA	1,496.40
DOGM calc using Rental Rate Blue Book 3Q00, 150 ft push, 1 ft depth, Means 2000 Crew B-10B (see attached calc. sheet), \$0.68/CY							

# RECLAMATION COST BASIS

last revision

17/26/2000

MTL. REDISTRIBUTION, GR. WORK BULLDOZER-D9N

==>

Parameters Used in Calculations for File No.

## DETAILS/ASSUMPTIONS

- CAT D9N dozer, 370hp, U-blade, track type
  - Info from CAT Performance Handbook, edition 23, section 1, page 60
  - Operator: Average, correction factor = 0.75
  - Material: ASSUME rock,hard to cut, factor = 1.00
  - Slot Dozing: factor = 1.20; Visibility: excellent, factor = 1.0
  - Job Efficiency: 50min/hr, factor = 0.83; Direct Drive Trans: factor =0.80
  - Mtl Weight: ASSUME 2550 LB/CY 2550 factor= 0.90
  - Grade: ASSUME +5%, factor =0.90
  - Distance: ASSUME average push distance = 100 feet 25 ft increments
  - => see Sec. 1, pg 57, Uncorrected Max Prod 1250 (LCY/HR) <<@vlookup
- |                                |      |      |      |      |
|--------------------------------|------|------|------|------|
| Correction Factors shown above | 0.75 | 1.00 | 1.20 | 1.00 |
|                                | 0.83 | 0.80 | 0.90 | 0.90 |

Overall Correction Factor = 0.49

Est Production = (Max Prod.) x (Overall Correction Fac 606.39 (CY/HR)

FROM RENTAL RATE BLUE BOOK 3Q/00

EQUIP OPER

Hourly Cost, D9N/EROPS U blade 155.00 51.15

Mult by regional factor 0.87 0.87

Sub-totals 134.08 44.24

Sub-total Equipment & Operating Cost 178.32 (\$/HR)

FROM MEANS HEAVY CONSTRUCTION COST DATA 2000

Crew B-10B, 1-Equip Operator (med), hourly cost 40.87 (\$/HR)

TOTAL COST PER HOUR 219.19 (\$/HR)

AREA DEPTH VOL

- 1.0 ft deep over one acre 43560 1.0 1613.3 (CY)
- 1.5 ft deep over one acre 43560 1.5 2420.0 (CY)
- 8 inches deep over one acre 43560 0.7 1075.6 (CY)

NOTE: Cost/Acre is dependent upon depth/acre (volume of mtl)

(\$/ACRE) (\$/CY)

COST/ACRE 1.0 FT DEEP 583.17 0.36

COST/ACRE 1.5 FT DEEP 874.75 0.36

COST/ACRE 8 INCH DEEP 388.78 0.36

BULLDOZER-D9N

D9N

==>

current push distance used =

100 ft

Parameters Used in Calculations for File No.

## DETAILS/ASSUMPTIONS

-CAT D8N dozer, 285hp, U-blade, track type  
-Info from CAT Performance Handbook, edition 23, section 1, page 60  
-Operator: Average, correction factor = 0.75  
-Material: ASSUME rock,hard to cut, factor => 0.80  
-Slot Dozing: factor = 1.20; Visibility: excellent, factor = 1.0  
-Job Efficiency: 50min/hr,factor = 0.83; Direct Drive Trans: factor =0.80  
-Mtl Weight: ASSUME 2550 LB/CY 2550 factor= 0.90  
-Grade: ASSUME +5%, factor =0.90  
-Distance: ASSUME average push distance = 150 feet 25 ft increments  
=> see Sec. 1, pg 57, Uncorrected Max Prod. 710 (LCY/HR) <<@vlookup  
Correction Factors shown above 0.75 0.80 1.20 1.00  
0.83 0.80 0.90 0.90

Overall Correction Factor = 0.39

Est Production = (Max Prod.) x (Overall Correction Fact 275.54 (CY/HR)

FROM RENTAL RATE BLUE BOOK 3Q/00

EQUIP OPER

Hourly Cost, D8N/EROPS, U-blade 125.00 38.05

Multi by regional factor 0.87 1.00

Sub-totals 108.13 38.05

Sub-total Equipment &amp; Operating Cost 146.18 (\$/HR)

FROM MEANS HEAVY CONSTRUCTION COST DATA 2000

Craw B-10B, 1 Equip Operator (med), hourly cost 40.87 (\$/HR)

TOTAL COST PER HOUR 187.05 (\$/HR)

	AREA	DEPTH	VOL
-1.0 ft deep over one acre	43560	1.0	1613.3 (CY)
-1.5 ft deep over one acre	43560	1.5	2420.0 (CY)
-8 inches deep over one acre	43560	0.7	1080.9 (CY)

NOTE: Cost/Acre is dependent upon depth/acre (volume of mtl)

(\$/ACRE) (\$/CY)

COST/ACRE 1.0 FT DEEP 1095.17 0.68

COST/ACRE 1.5 FT DEEP 1642.75 0.68

COST/ACRE 8 INCH DEEP 733.76 0.68

BULLDOZER-D8N

D8N

==&gt;

current push distance used =

150 ft

## SUMMARY

BULLDOZER-D8N	150 ft push	D8N
COST/ACRE 1.0 FT DEEP	1095.17 \$/acre	0.68 \$/CY

BULLDOZER-D9N	100 ft push	D9N
COST/ACRE 1.0 FT DEEP	583.17 \$/acre	0.36 \$/CY

# RECLAMATION COST BASIS REVEGETATION TASKS

DOZER **DRAFT** 4 XL SERIES III  
last revision 7-May-2001

==>

Parameters Used in Calculations for File No.

## DETAILS/ASSUMPTIONS

- CAT Edition 31 handbook lacks info for DH4 model, all specifications here are for D4C Series III Dozer
- Cat D4C XL Series III: 80 hp, 16,573 lbs; Cat DH4 LGP Series III (1996) 81 hp.
  - Cat dozer 4P: straight blade width 13 ft 1 inch, angled blade 14 ft 6 inch,
  - Cat dozer D4C XL: drawbar pull versus ground speed: 4.0 mph at 6.8 lbs, 2.0 mph at 13.5 lbs.
  - ASSUME width of pass for disk is straight blade width plus 1.5 feet on each side, i.e. total width of 16 feet
  - ASSUME width of pass for drill seeder and disk width are the same at 12 feet.
  - ASSUME an overlap of 1/2 foot between passes, giving an effective pass width of 11.5 feet'
  - ASSUME average speed for disking and drill seeding is 4.0 mph, and mulching is 5.0 mph
  - ASSUME disk/drill cost is same as trailer mounted mulcher Finn B70, 7 tph, \$10/hr rental, \$3.35/hr oper
  - one acre = 43,560 SF; use ~400' x 110' block
  - ASSUME every 400' requires 0.30 min to pivot, turn, and raise & lower as needed
  - ASSUME work efficiency of 50 minutes/hour => 83%

DH4	DIST	SPEED	ADD	MIN/PASS
Time/Pass =(dist/speed)+add on	400.00	5.00	0.30	1.21
NOTE: SPEED IN MPH		TIME		PASS/HR
#Pass/Hour = time/(MIN/PASS)		50.00		41.35
		FT/PASS		SF/PASS
Sq-ft of effective coverage =(length/pass)*(FT/PASS)		11.50		4600.00
Acreage covered = (SF/PASS)/(SF/acre)			ACRE/PASS	0.11
Acreage covered/Hr =(ACRE/PASS)*(PASS/HR)			ACRE/HR	4.37
Hrs to cover one acre = 1 /(ACRE/HR)			HRS/ACRE	0.23
			34.9 ACRE/8HR-DAY	

FROM RENTAL RATE BLUE BOOK 3Q/00

	EQUIP	OPER
\$/hr. D4H LGP Series III (1996) EROPS (pg 9-4)	49.00	15.50
Finn trailer mounted mulcher B70, 7 tph (pg 17)	10.00	3.35
Sub-totals	59.00	18.85
Mult by regional factor (page 9-vii)	0.87	1.00
Sub-totals	51.04	18.85

Sub-total Equipment & Operating Cost

69.89 (\$/HR)

FROM MEANS HEAVY CONSTRUCTION COST DATA 2001

Crew B-10B, 1 Equip Operator (med), hourly cost

42.55 (\$/HR)

==>

TOTAL COST PER HOUR  
TOTAL APPLICATION COST PER ACRE  
current speed used =  
RECLAMATION TREATMENTS D4H

112.44 (\$/HR)  
\$25.75 (\$/ACRE)

5.00 mph

# RECLAMATION COST BASIS REVEGETATION TASKS

DOZER **D4 XL SERIES III**  
last revision 7-May-2001

==>

Parameters Used in Calculations for File No.

## DETAILS/ASSUMPTIONS

- CAT Edition 31 handbook lacks info for DH4 model, all specifications here are for D4C Series III Dozer
- Cat D4C XL Series III: 80 hp, 16,573 lbs; Cat DH4 LGP Series III (1996) 81 hp.
- Cat dozer 4P: straight blade width 13 ft 1 inch, angled blade 14 ft 6 inch,
- Cat dozer D4C XL: drawbar pull versus ground speed: 4.0 mph at 6.8 lbs, 2.0 mph at 13.5 lbs.
- ASSUME width of pass for disk is straight blade width plus 1.5 feet on each side, i.e. total width of 16 feet
- ASSUME width of pass for drill seeder and disk width are the same at 12 feet.
- ASSUME an overlap of 1/2 foot between passes, giving an effective pass width of 11.5 feet'
- ASSUME average speed for disking and drill seeding is 4.0 mph, and mulching is 5.0 mph
- ASSUME disk/drill cost is same as trailer mounted mulcher Finn B70, 7 tph, \$10/hr rental, \$3.35/hr oper
- one acre = 43,560 SF; use ~400' x 110' block
- ASSUME every 400' requires 0.30 min to pivot, turn, and raise & lower as needed
- ASSUME work efficiency of 50 minutes/hour => 83%

DH4	DIST	SPEED	ADD	MIN/PASS
Time/Pass =(dist/speed)+add on	400.00	4.00	0.30	1.44
NOTE: SPEED IN MPH		TIME		PASS/HR
#Pass/Hour = time/(MIN/PASS)		50.00		34.81
		FT/PASS		SF/PASS
Sq-ft of effective coverage =(length/pass)*(FT/PASS)		11.50		4600.00
Acreage covered = (SF/PASS)/(SF/acre)			ACRE/PASS	0.11
Acreage covered/Hr =(ACRE/PASS)*(PASS/HR)			ACRE/HR	3.68
Hrs to cover one acre = 1 /(ACRE/HR)			HRS/ACRE	0.27
			<b>29.4 ACRE/8HR-DAY</b>	

## FROM RENTAL RATE BLUE BOOK 3Q/00

	EQUIP	OPER
\$/hr, D4H LGP Series III (1996) EROPS (pg 9-4)	49.00	15.50
Finn trailer mounted mulcher B70, 7 tph (pg 17)	10.00	3.35
Sub-totals	59.00	18.85
Mult by regional factor (page 9 vii)	0.87	1.00
Sub-totals	51.04	18.85

Sub-total Equipment & Operating Cost

69.89 (\$/HR)

## FROM MEANS HEAVY CONSTRUCTION COST DATA 2001

Crew B-10B, 1-Equip Operator (med), hourly cost	42.55 (\$/HR)
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TOTAL COST PER HOUR

112.44 (\$/HR)

TOTAL APPLICATION COST PER ACRE

\$30.59 (\$/ACRE)

current speed used =

4.00 mph

RECLAMATION TREATMENTS D4H